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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,611	08/16/2001	Shigeru Murakami	Q54917	2483

7590 10/08/2003

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EXAMINER	
PIERCE, JEREMY R	

ART UNIT	PAPER NUMBER
1771	

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/913,611	MURAKAMI ET AL.	
	Examiner	Art Unit	
	Jeremy R. Pierce	1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-13* is/are pending in the application.

4a) Of the above claim(s) *9-12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-8 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. The amendment filed on July 17, 2003 has been entered. Claims 1 and 2 were cancelled. Claims 3-8 have been amended. Claim 13 has been added. Applicant's arguments presented in the amendment are sufficient to overcome the 35 USC 102 rejection as being anticipated by Dickson et al.

Information Disclosure Statement

2. Applicant requests that the Examiner place his initials next to each reference to indicate their consideration. This was already done in the last Office Action. Although the references were initially crossed out, the line was erased with white out and the initials were placed next to the references to show that they were considered. This may not have been as clear on the copy of the 1449 that Applicant received. The consideration of the JP 44-23138 reference was not needed on both forms.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 5 are dependent claims, but fail to recite from which claim they depend. The Examiner will assume that both claims 4 and 5 are meant to depend from claim 3, in light of the recent amendment.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3-8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickson et al. (U.S. Patent No. 3,484,183).

Dickson et al. disclose a woven carbon fabric obtained by firing a cellulose-based woven fabric (column 2, lines 23-32). In an example, Dickson et al. describe the resistivity to be approximately 0.1 ohm-cm (column 10, line 74). Also in this example, Dickson et al. disclose the thickness of the fabric to be 25 mils (column 10, line 72), which equals 0.635 mm. Dickson et al. do not disclose the fabric to have a thickness between 0.05 and 0.4 mm. However, decreasing the thickness of the fabric is adjusting a result effective variable, with the result being decreased resistivity in the thickness direction. It would have been obvious to a person having ordinary skill in the art to decrease the thickness of the carbon fabric from 25 mils to between 0.05 and 0.4 mm in order to decrease its resistivity, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617

F.2d 272, 205 USPQ 215 (CCPA 1980). With regard to other property limitations in the claims, although Dickson et al. do not explicitly teach the limitations of gas permeability, compressive strength, electrical resistance measured between two copper plates, and orientation, it is reasonable to presume that said limitations are inherent to the invention. Support for said presumption is found in the use of similar materials (i.e. cellulose-based woven fabric) and in the similar production steps (i.e. firing in a non-oxidizing atmosphere to create a carbon fabric) used to produce the conductive carbon fabric. For instance, Applicant discloses using conventional cellulose-based fabrics based on a plain weave (page 8, lines 19-28 and page 17, line 6). Dickson et al. also disclose using commercial cellulose based fabrics based on a plain weave (column 7, lines 51-54). Additionally, the processes used to create the fabrics are similar because Dickson et al. disclose immersing the fabric in metal phosphate salt before carbonizing (column 2, lines 63-71), as does Applicant (page 17, lines 15-18). Afterward Dickson et al. bake the fabric at very high temperature in a non-oxidizing atmosphere (column 10, lines 64-67), as does Applicant (page 17, lines 18-22). In the alternative, the claimed properties would obviously have been provided by the process disclosed by Dickson et al. by way of adjusting result effective variables to improve the conductivity of the fabric. With regard to claims 4 and 5, Dickson et al. do not discuss orientation. However, Applicant states in the specification that the claimed orientation is achieved with a plain woven cellulose-based fabric (page 10, lines 7-26 and Examples). Dickson et al. also disclose using a commercial plain weave cellulose-based fabric (column 7, lines 51-54). Absent a teaching from Dickson et al. that there is a modification in the orientation of the fabric,

the Examiner must assume that the claimed orientation would be present in Dickson et al., since both the reference and Applicant use conventional plain weave fabrics. Applicant does not set forth any particular manner of weaving a fabric to attain the claimed orientation that Dickson et al. does not disclose. With regard to claim 7, Dickson et al. disclose that properties can be modified by inclusion of fluoro-carbon fibers (column 14, lines 36-39), which would add a water repellant feature.

Response to Arguments

7. Applicant's arguments filed on July 17, 2003 have been fully considered but they are not persuasive. The arguments with regard to the 102 rejection were found persuasive, and that rejection has been withdrawn.

8. Applicant argues that the Examiner is not correct in asserting that a decrease in the thickness of the fabric would result in a decreased resistivity. However, resistivity is a measure of electrical resistance per unit length. If the thickness is decreased, the length the electricity must travel is lowered, and thus, the resistivity would be decreased. The Examiner maintains the assertion that a decrease in thickness would result in a decrease of resistivity.

9. Applicant argues that the Examiner is not correct that the process described in Dickson et al. would inherently result in the recitations of the present claims. However, Applicant fails to point out how the material of Dickson et al. is different from the present invention so that it would not possess the claimed properties. The materials used in both inventions are similar, as set forth above in the rejection. The processes used to create

both fabrics may not be exactly the same, but they are similar enough to support a conclusion that the product of Dickson et al. would have the same properties as Applicant's invention.

10. Applicant argues that Dickson et al. do not note the relationship between the orientation of a cellulose fabric and the layer transverse direction of electrical resistance. However, Applicant's state in the specification that the orientation of a conventional plain weave cellulose-based fabric satisfies the orientation requirement of the claims, as set forth above in the rejection. Dickson et al. also use a commercial plain weave cellulose-based fabric.

11. Applicant argues that the use of a certain cellulose fabric in a certain manner and fired to obtain a carbon fiber fabric can produce a carbon fiber fabric having desirable properties. However, the certain cellulose fabric and the certain manner that are used to obtain these desirable products, as shown in the specification, do not appear materially different from that which is disclosed by Dickson et al.

12. Applicant points out the production differences between Dickson et al. and the present invention. While there may be some small differences, the production processes are still essentially similar, and do not appear to be materially different as both processes produce the fully carbonized fabric after heating in a non-oxidative atmosphere. Furthermore, the steps of production are not present in the current claims, as the claims are directed to the product itself, and not the process of making it. Additionally, Applicant points out that Dickson et al. heat in an oxygen atmosphere.

While this is initially true, Dickson et al. later heat the fabric in a non-oxygen atmosphere (column 10, lines 65-67) similar to Applicant.

13. Applicant argues that Dickson et al. do not provide any guidance or motivation to adjust variables to arrive at the properties of gas permeability and orientation recited in the present claims. However, Applicant fails to show in the specification any kind of process of producing that is materially different from that shown in Dickson et al. Adjusting known variables, such as gas permeability and resistivity, in the art of fuel cells is common to achieve the desired properties.

14. Applicant argues that in order to obtain a carbon fiber fabric having a water repellency property as cited in claim 7, it would be necessary to coat the fabric with a water repellant resin. However, Applicant's claim only recites, "The carbon fiber woven fabric as claimed in claim 3, which has a water repellant property." No recitation of a coating is made. Nor is there a recitation as to the degree of water repellency required in the fabric. Since fluoro-carbon acts as water repellant, it would supply a water repellant property to the fabric, to some degree. Dickson et al. do not need to teach coating the fabric, because it is not claimed.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy R. Pierce whose telephone number is (703) 605-4243. The examiner can normally be reached on Monday-Thursday 7-4:30 and alternate Fridays 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (703) 308-2414. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Jeremy R. Pierce
Examiner
Art Unit 1771

October 1, 2003

ELIZABETH M. COLE
PRIMARY EXAMINER